

Serial No. 09/941,655

Amendment Dated: December 23, 2004
Reply to Office Action Mailed June 25, 2004
Attorney Docket No. 381KA/50358

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended) A vehicular alternator comprising a rotor and a stator constituted by coiling stator windings over a stator core, wherein:

said rotor comprises i) a pair of claw-type magnetic poles which are arranged in an opposed relation, and each of which has a plurality of claws that are cantilevered at a proximal end thereof and extend axially to a distal end opposite said proximal end, ii) permanent magnets having rectangular lateral surfaces which face in a circumferential direction of the rotor and form magnetic pole surfaces [[,]] that are disposed between and in contact with opposing lateral surfaces of adjacent claws of said pair of claw-type magnetic poles, and iii) field windings coiled radially inward of said plurality of claws; [[and]]

the opposing lateral surfaces of said claws adjacent said permanent magnets are formed into substantially the same rectangular shape as the magnetic pole surfaces with which they are in contact, such that said lateral

surfaces of said claws are in contact with the whole of the rectangular lateral magnetic pole surfaces of said permanent magnets; and [[.]])

each of said claws has, in a circumferentially central portion thereof, a radial thickness that is tapered along an axial direction, being thicker at said proximal end than at said distal end thereof.

Claim 2. (Currently Amended) A vehicular alternator according to Claim 1, wherein each of said plurality of claws has an said lateral surfaces of said claws are formed by circumferentially laterally disposed auxiliary magnetic pole portion portions which contacts contact the whole of the magnetic pole surface surfaces of said permanent magnet magnets, and has a surface which has a shape that differs from a shape of an axial cross section of a project radially inwardly from said circumferentially central portion of said [[claw.]] claws.

Claim 3. (Previously Presented) A vehicular alternator according to Claim 2, wherein said auxiliary magnetic pole portion is formed to have a greater thickness at a radially outer portion than at a radially inner portion thereof.

Claim 4. (Cancelled)

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Claim 5. (Currently Amended) A vehicular alternator according to

Claim [[4,]] 1, wherein said plurality of claws are interconnected by a substantially ring-shaped coupling member.

Claim 6. (Previously Presented) A vehicle alternator according to

Claim 1, wherein each of said plurality of claws has a magnet holding portion for holding said permanent magnet.

Claims 7.-8. (Cancelled)

Claim 9. (Previously Presented) A vehicular alternator according to

Claim 1, wherein a protective member is disposed at least on an outer side of said permanent magnet in the radial direction of said rotor.

Claim 10. (Currently Amended) A vehicular alternator comprising a rotor and a stator constituted by coiling stator windings over a stator core, wherein:

said rotor comprises i) a pair of claw-type magnetic poles arranged in an opposed relation, ii) permanent magnets having rectangular lateral surfaces which face in a circumferential direction of the rotor and form magnetic pole surfaces[[,]] that are disposed between and in contact with opposing lateral

surfaces of adjacent claws of said pair of claw-type magnetic poles, and iii) field windings coiled radially inward of said plurality of claws;

a circumferentially central portion of each of said claws is tapered toward a tip of each respective claw, such that said circumferentially central portion has a substantially triangular or trapezoidal shape in a radial section plane along an axial direction of the rotor;

each of said claws has auxiliary magnetic pole portions formed at circumferentially lateral ends thereof, which auxiliary magnetic pole portions form the opposing lateral surfaces of said claws adjacent said permanent magnets, project radially inwardly from said circumferentially central portion of said claws and have substantially the same rectangular shape as the magnetic pole surfaces with which they are in contact, such that said lateral surfaces of said claws are in contact with the whole of the magnetic pole surfaces of said permanent magnets.

Claim 11. (Currently Amended) A vehicular alternator having a stator including a stator core and stator windings coiled over the stator core, and a rotor provided to rotate in a circumferential direction relative to the stator, with gaps separating said rotor and stator, wherein said rotor comprises:

a pair of claw-type magnetic poles arranged in an opposed relation,
each of said claw-type magnetic poles having a plurality of claws;

field windings coiled with the claw-type magnetic poles; and

a plurality of permanent magnets provided to said claw-type magnetic poles; wherein,

~~each of said claw type magnetic poles has a plurality of claws;~~

claws of one of the pair of the claw-type magnetic poles and claws of the other of the pair of the claw-type magnetic poles are disposed alternately in said circumferential direction of said rotor;

each of the claws has a proximal end portion at which said claw is cantilevered, a distal end portion having a radial thickness that is thinner than the proximal end portion, and lateral surfaces portions which face in substantially opposed directions circumferentially of said rotor;

said permanent magnets are interposed between [[said]] claws which are circumferentially adjacent to each other in said circumferential direction of said rotor, respectively;

each of said permanent magnets interposed between said ~~respective~~ circumferentially adjacent claws has lateral magnetic pole surfaces which face in opposed directions circumferentially of said rotor [[;]] and has a radial thickness that is greater than the radial thickness of the distal end portion of said claws;

 said permanent magnets are interposed between said circumferentially adjacent claws such that a first portion of each of the lateral magnetic pole surfaces of the permanent magnets faces a corresponding one of the lateral surfaces portions of the claws in an opposed relation while a remaining portion of each of the lateral surfaces of the permanent magnets provides a magnetic pole surface [[; and]] does not face said corresponding one of the lateral portions of the claws;

auxiliary magnetic pole portions are provided between said claws and said permanent magnets; and

each of said auxiliary magnetic pole portions is in contact with substantially a whole area of the magnetic pole surfaces of circumferentially adjacent permanent magnets, including said remaining portion, for enabling magnetic flux outgoing from said remaining portion to flow into the claws.

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~~a whole area of the magnetic pole surface of each of the permanent magnets physically contacts with said lateral surface of each of the claws so as to magnetically connected therewith.~~

Claim 12. (Cancelled)

Claim 13. (New) A vehicular alternator according to Claim 11, wherein:

each of said auxiliary magnetic pole portions is formed as a single piece with one of said claws, and covers said magnetic pole surface with said lateral portion of the claw; and

the auxiliary magnetic pole portions are in contact with the magnetic pole surface.

Claim 14. (New) The vehicular alternator according to Claim 11, wherein said auxiliary magnetic pole portions comprises members interposed between said magnetic pole surfaces and said claw lateral portion, for holding said permanent magnet.